CLAIMS

1.   A broadcast video/audio data recording method characterized in that management data is recorded in a first file, a stream representing

5   broadcast in TS (Transport Stream) is recorded in a second file, a stream representing video and audio in PS (Program Stream) is recorded in a third file, a subsidiary file is provided separately from the first to third files, and the contents of the data in the files are indicated by the management data in the first file.

10   2.   The broadcast video/audio data recording method according to Claim 1, characterized in that the subsidiary file records all or part of input and broadcast video/audio, or copied or moved video/audio from all or part of broadcast video/audio recorded in the second or third file.

3.   The broadcast video/audio data recording method according

15   to Claim 1, characterized in that the subsidiary file is composed of a plurality of files, and all or part of the input broadcast, video and audio, or the broadcast, video and audio copied or moved from all or part of the broadcast, video and audio recorded in the second or third file are recorded in the plurality of files in the subsidiary file such that the respective combinations of

20   animated pictures having a same encoding format, audios having a same encoding format, still pictures having a same encoding format, animations having a same encoding format, text data having a same encoding format, game data having a same encoding format, electronic program guide data having a same encoding format, graphic having a same encoding format, and

25   three-dimensional video data having a same encoding format are recorded in the same files in the subsidiary file.

4.   The broadcast video/audio data recording method according to Claim 1, characterized in that data broadcast is recorded in any of the second, third, and subsidiary files while all or part of input broadcast

video/audio, or copied or moved video/audio from all or part of the broadcast video/audio recorded in the second, third, or subsidiary file are recorded in fourth or fifth file in the subsidiary file.

5.   The broadcast video/audio data recording method according

5   to Claim 1, characterized in that all or part of the input broadcast video/audio data or all or part of the data in the files is directly recorded in or copied or moved to a destination file if the format thereof corresponds to that of the destination file, whereas if the format thereof does not correspond to that of the destination file, it is recorded in or copied or moved

10   to the destination file after being converted to the corresponding format.

6.   The broadcast video/audio data recording method according to Claim 1, characterized in that the PS stream in the third file is a stream obtained by PS encoding analog broadcast.

7.   The broadcast video/audio data recording method according

15   to Claim 1, characterized in that the PS stream in the third file is a stream obtained by trans-coding digital broadcast from TS to PS.

8.   The broadcast video/audio data recording method according to Claim 1, characterized in that the broadcast stream represented in TS and recorded in the second file is converted into a video/audio stream

20   represented in PS and is thereafter recorded in the third file by copying or moving the same, and the management data is representative of   record information.

9.   The broadcast video/audio data recording method according to Claim 1, characterized in that the video/audio stream represented in TS

25   and recorded in the third file is converted into a broadcast stream represented in PS and is thereafter recorded in the second file by copying or moving the same, and the management data is representative of record information.

10.   The broadcast video/audio data recording method according

to Claim 1, characterized in that related information except broadcast is recorded in the subsidiary file, and the management data is representative of contents of the related information.

11.   The broadcast video/audio data recording method according to Claim 1, characterized in that related information except broadcast is recorded in a new file different from the first to third files and the subsidiary file, and the management data is representative of contents of the related information.

12.   The broadcast video/audio data recording method according to Claim 4, characterized in that the data broadcast includes program-link-type data broadcast, independent-type data broadcast, audio or radio broadcast, and text broadcast.

13.   The broadcast video/audio data recording method according to Claim 12, characterized in that the program-link-type data broadcast is recorded in the second file, the independent-type data broadcast, the audio or radio broadcast, or the text broadcast is recorded in the subsidiary file.

14.   The broadcast video/audio data recording method according to Claim 2, characterized in that the data to be copied or moved is all or part of animated picture data, audio data, still-picture data, animation, text data, game data, electronic program guide data, graphic, and three-dimensional video data.

15.   The broadcast video/audio data recording method   according to Claim 11, characterized in that the related information except broadcast is all or part of Internet information related to broadcast, Internet additional information, such as program additional information, director's cut information, director's comment information, E-commerce information, chat information, and prior notice information, and Internet broadcast information.

16.   A broadcast video/audio data recording method characterized in that there are provided a first file for recording management data and a

data file for recording as stored data at least either input broadcast video/audio data, or recorded broadcast video/audio data obtained as a result of copying or moving, the stored data being recorded in the data file in a format indicated by the management data.

5   17.   The broadcast video/audio data recording method according to Claim 16, characterized in that the broadcast video/audio data represented in TS is recorded in a second file, while broadcast video/audio data represented in PS is recorded in a third file, and the recorded data in the second and/or third file(s) is selectively copied or moved to the data file.

10   18.   The broadcast video/audio data recording method according to Claim 17, characterized in that there is provided, as the data file, a fourth file for storing data obtained by copying or moving at least part of the input broadcast video/audio data or the recorded data in the second or third file.

      19.   The broadcast video/audio data recording method according 15 to Claim 16, characterized in that the management data is provided and include all or part of a broadcast recording file identification flag, a related information recording file identification flag other than broadcast, a broadcast identification flag, and a related information identification flag except broadcast, and these flags indicate all or part of the file in which the 20 broadcast video/audio data is recorded, the file in which the related information except broadcast is recorded, contents of the recorded broadcast video/audio data, and contents of the recorded related information except broadcast.

      20.   The broadcast video/audio data recording method according 25 to Claim 19, characterized in that:

the broadcast recording file identification flag and the related information recording file identification flag other than broadcast indicate whether or not ordinary digital broadcast without data broadcast, ordinary digital broadcast with program-link-type data broadcast, independent-type

data broadcast, audio or radio broadcast, text broadcast, and analog broadcast are recorded in their corresponding files, or the files in which the respective broadcasts are recorded, or indicate whether or not related information other than broadcast is recorded in its corresponding file, or the

5 file in which the related information other than broadcast is recorded;

the broadcast identification flag and the related information identification flag other than broadcast indicate all or part of:

whether or not ordinary digital broadcast without data broadcast, ordinary digital broadcast with program-link-type data broadcast,

10 independent-type data broadcast, audio or radio broadcast, text broadcast, analog broadcast, and related information other than broadcast are recorded in their corresponding streams,

whether the relevant data in the recorded broadcast data or the recorded related information other than broadcast has been directly

15 recorded or has been copied or moved from other files;

whether there is a source or not when the data has been copied or moved, and, when there is a source, a file name, a source stream name, and source stream number;

which type of data the source data and the recorded data are, when

20 the data has been copied or moved and its source is known, while otherwise the recorded data is, among animated pictures, audio, still pictures, animation, text data, game data, electronic program guide data, graphic data, and three-dimensional video data; an animated picture data compression method when the data is animated picture data, an audio data compression

25 method when the data is audio, a still-picture data compression method when the data is still-picture data, an animation data compression method when the data is animation data, a text data compression display method when the data is text data, a game data method when the data is game data, an electronic program guide method when the data is electronic program guide

data, a graphic method when the data is graphic, a three-dimensional video data method when the data is three-dimensional video data, and a stream mode, and a flag indicating whether the related information other than broadcast is ordinary Internet data or streaming data or other data.

5   21.   The broadcast video/audio data recording method according to Claim 1, characterized in that the first file records as the management data all or part of:

a broadcast recording file identification flag, a related information recording file identification flag other than broadcast, a broadcast

10   identification flag, and a related information identification flag other than broadcast;

a flag which indicates whether the data broadcast transmission method is the data carousel mode, or the event message transmission mode, or the mode including both, a flag which indicates, in case of data carousel

15   broadcast, whether the mode is for recording all the data or for recording only updated data, a flag which indicates, in broadcast of updatable data such as news, weather forecast, and stock information, whether the automatic update of old data with new data is set ON or OFF, a flag which indicates whether or not the latest data update start time and end time and a time map

20   exist, and a flag which indicates whether the stream is an ordinary broadcast stream or a server-type broadcast stream.

22.   The broadcast video/audio data recording method according to Claim 20, characterized in that indications are made about whether the animated picture data compression method is, MPEG video, or H.264 video, or

25   Windows (registered trademark) Media video, about whether the audio data compression method is, MPEG audio, or Dolby audio, or DTS audio, and about whether the still-picture data compression method is, JPEG or PNG.

23.   A broadcast video/audio data recording apparatus for recording data by the recording method according to Claim 1, and/or a

broadcast video/audio data reproducing apparatus for reproducing the data by the recording method according to Claim 1.

24. A broadcast video/audio data recording apparatus for recording data by the recording method according to Claim 16, and/or

5 broadcast video/audio data reproducing apparatus for reproducing the data by the recording method according to Claim 16.

25. A broadcast video/audio data recording medium recorded by the recording method according to Claim 1.

26. A broadcast video/audio data recording medium recorded by

10 the recording method according to Claim 16.

27. A data stream recording method for recording a data stream by storing data streams having mutually different formats in separate files, respectively, converting the formats between the stored data streams, and adding data corresponding to the converted format.

15 28. The data stream recording method according to Claim 27, characterized in that the data streams include a transport stream (TS) and a program stream (PS).

29. The data stream recording method according to Claim 27, characterized in that the transport stream (TS) is a broadcast data stream,

20 while the program stream (PS) is a non-broadcast data stream or a stream generated from broadcast, and management data for distinguishing the TS from the PS is stored in a separate file.

30. A data stream record reproduction apparatus characterized by comprising:

25 two files for storing data streams having mutually different formats, respectively;

means for converting the mutually different formats between the data streams; and

another file for storing the converted data streams according to the

converted format thereof,

the data streams being reproduced from another file.

31.   The data stream record reproduction apparatus according to Claim 30, characterized by further comprising data storing means for

5   distinguishing the mutually different data streams.

32.   A recording medium characterized by having formats capable of supporting data streams having mutually different formats.

33.   A broadcast video/audio data recording apparatus characterized by comprising:

10   a first file for recording management data;

a second file for recording a stream in which broadcast is represented in TS (Transport Stream);

a third file for recording a stream in which video/audio is represented in PS (Program Stream); and

15   a subsidiary file provided separately from the first to third files,

the contents of the broadcast video/audio data recorded in the files being indicated by the management data.

34.   The broadcast video/audio data recording apparatus according to Claim 33, characterized in that the subsidiary file includes a fourth file for

20   recording data copied or moved from all or part of input broadcast video/audio, or all or part of the broadcast video/audio recorded in the second or third file.

35.   The broadcast video/audio data recording apparatus according to Claim 33, characterized in that the subsidiary file includes files for

25   recording data which are copied or moved from all or part of the input broadcast, video and audio, or all or part of the broadcast, video and audio recorded in the second or third file, while combining animated pictures having a same encoding format, audios having a same encoding format, still pictures having a same encoding format, animations having a same encoding format,

text data having a same encoding format, game data having a same encoding format, and electronic program guide data having a same encoding format, graphic having a encoding format, and three-dimensional video data having a same encoding format, and recording them in the separate files, respectively,

5   the contents of the broadcast video/audio data recorded in the files being indicated by the management data.

36.   The broadcast video/audio data recording apparatus according to Claim 33, characterized in that the second or third file records data broadcast, and the subsidiary file includes a fourth or fifth file for recording

10   data which are copied or moved from all or part of the input broadcast video/audio, or all or part of the broadcast video/audio recorded in the second or third file, the contents of the broadcast video/audio data recorded in the files being indicated by the management data.

37.   The broadcast video/audio data recording apparatus according

15   to Claim 36, characterized by comprising files for recording data which are copied or moved from all or part of the input broadcast video/audio, or all or part of the broadcast video/audio recorded in the second or third file, by combining animated pictures having a same encoding format, audios having a same encoding format, still pictures having a same encoding format,

20   animations having a same encoding format, text data having a same encoding format, game data having a same encoding format, and electronic program guide data having a same encoding format, graphic having a encoding format, and three-dimensional video data having a same encoding format, and recording them in the separate files, respectively,

25   the contents of the broadcast video/audio data recorded in the files being indicated by the management data.

38. A broadcast video/audio data reproducing apparatus characterized by comprising means for reproducing the data recorded in the broadcast video/audio data recording apparatus according to Claim 33 with reference to

the management data in the first file.

39.   The broadcast video/audio data recording apparatus according to Claim 33, characterized in that the subsidiary file includes animated pictures, audio, still pictures, animation, text data, game data, electronic
5   program guide data, graphic, and three-dimensional video data each of which is assigned with header information.

40.   The broadcast video/audio data recording apparatus according to Claim 33, characterized in that the data in the subsidiary file is recorded by individually gathering animated pictures having a same encoding format,
10   audios having a same encoding format, still pictures having a same encoding format, animations having a same encoding format, text data having a same encoding format, game data having a same encoding format, and electronic program guide data having a same encoding format, graphic having a encoding format, and three-dimensional video data having a same encoding format,
15   the gathered data being given header information.

41.   The broadcast video/audio data recording apparatus according to Claim 33, characterized in that the header information includes at least part of:

    a flag indicating whether ordinary digital broadcast without data
20   broadcast, ordinary digital broadcast with program-link-type data broadcast, independent-type data broadcast, audio or radio broadcast, text broadcast, analog broadcast, or related information other than broadcast   is recorded or not;

    a flag indicating whether the recorded broadcast data or related
25   information other than broadcast   has been directly recorded or copied or moved from another file;,

    a flag which indicates whether there is a source when the data has been copied or moved,;

    a file name, a source stream name, and a source stream number when

there is a source;

a flag which indicates which the source data and the recorded data are when the data has been copied or moved and the source is known, and otherwise indicates which the recorded data is, among animated pictures,

5 audio, still pictures, animation, text data, game data, electronic program guide data, graphic, and three-dimensional video data;

a flag which indicates an animated picture data compression method when the data is animated pictures, an audio data compression method when the data is audio, a still-picture data compression method when the

10 data is still pictures, an animation data compression method when the data is animation, a text data compression display method when the data is text data, a game data method when the data is game data, an electronic program guide method when the data is electronic program guide data, a graphic method when the data is graphic, a three-dimensional video data method when the

15 data is three-dimensional video data, and a stream mode, and whether the related information other than broadcast is ordinary Internet data or streaming data or other data;

genre and contents information, thumbnail information, resume marker information, protect information, temporary delete information,

20 bookmark information, playlist information, still-picture reproduction time information, synchronous audio information, audio dubbing information; and

header length and data length.

42. The broadcast video/audio data recording apparatus according to Claim 41, characterized in that the header information is added with all or

25 part of:

a flag which indicates whether the data broadcast transmission method is a data carousel mode, or an event message transmission mode, or a mode including the both; a flag which indicates, in case of data carousel broadcast, whether the mode is for recording all the data or for recording

only updated data; a flag which indicates whether the automatic update of old data with new data is set OFF or ON in broadcast of updatable data such as news, weather forecast, and stock information; a flag which indicates whether or not the latest data update start time and end time, and a time

5   map exist; and a flag which indicates whether the stream is an ordinary broadcast stream or a server-type broadcast stream.

43.   The broadcast video/audio data recording apparatus according to Claim 41, characterized in that it is indicated which the animated picture data compression method is, MPEG video, or H.264 video, or Windows

10   (registered trademark) Media video, which the audio data compression method is, MPEG audio, or Dolby audio, or DTS audio, and which the still-picture data compression method is, JPEG or PNG.

44.   The broadcast video/audio data recording apparatus according to Claim 33, characterized in that the subsidiary file records total header

15   information obtained by integrating header information of animated pictures/audios/still pictures/animation/text data/ game data/electronic program guide data/graphic/three-dimensional video data all of which are recorded in the subsidiary file.

45.   The broadcast video/audio data recording apparatus according

20   to Claim 44, characterized in that the total header information includes all or part of the header information described in Claim 41.

46.   A data recording medium recorded by using the broadcast video/audio data recording apparatus according to Claim 33.

47.   A broadcast video/audio data recording method for storing

25   edited data obtained by editing input broadcast video/audio data in a file different from the input broadcast video/audio data, characterized in that the file for the edited data stores header information for the edited data, together with the edited data.

48.   The broadcast video/audio data recording method according

to Claim 47, characterized in that the header information is for at least one of animated pictures, audio, still pictures, animation, text data, game data, electronic program guide data, graphic, and three-dimensional video data.

49.   The broadcast video/audio data recording method according to Claim 47, characterized in that the header information is assigned to and represents each of integrations of data obtained by individually integrating animated pictures having a same encoding format, audios having a same encoding format, still pictures having a same encoding format, animations having a same encoding format, text data having a same encoding format, game data having a same encoding format, and electronic program guide data having a same encoding format, graphic having a encoding format, and three-dimensional video data having a same encoding format.

50.   The broadcast video/audio data recording method according to Claim 47, characterized in that the header information includes at least part of:

a flag indicating whether ordinary digital broadcast without data broadcast, ordinary digital broadcast with program-link-type data broadcast, independent-type data broadcast, audio or radio broadcast, text broadcast, analog broadcast, or related information other than broadcast   is recorded or not;

a flag indicating whether the recorded broadcast data or related information other than broadcast   has been directly recorded or copied or moved from another file;,

a flag which indicates whether there is a source when the data has been copied or moved,;

a file name, a source stream name, and a source stream number when there is a source;

a flag which indicates which the source data and the recorded data are when the data has been copied or moved and the source is known, and

otherwise indicates which the recorded data is, among animated pictures, audio, still pictures, animation, text data, game data, electronic program guide data, graphic, and three-dimensional video data;

a flag which indicates an animated picture data compression method
5   when the data is animated pictures, an audio data   compression method when the data is audio, a still-picture data compression method when the data is still pictures, an animation data compression method when the data is animation, a text data compression display method when the data is text data, a game data method when the data is game data, an electronic program guide
10   method when the data is electronic program guide data, a graphic method when the data is graphic, a three-dimensional video data method when the data is three-dimensional video data, and a stream mode, and whether the related information other than broadcast   is ordinary Internet data or streaming data or other data;

15   genre and contents information, thumbnail information, resume marker information, protect information, temporary delete information, bookmark information, playlist information, still-picture reproduction time information, synchronous audio information, audio dubbing information; and
         header length and data length.

20   51.   The broadcast video/audio data recording method according to Claim 50, characterized in that the header information further additionally includes all or part of:

a flag which indicates whether the data broadcast transmission method is a data carousel mode, or an event message transmission mode, or a
25   mode including the both; a flag which indicates, in case of data carousel broadcast, whether the mode is for recording all the data or for recording only updated data; a flag which indicates whether the automatic update of old data with new data is set OFF or ON in broadcast of updatable data such as news, weather forecast, and stock information; a flag which indicates

whether or not the latest data update start time and end time, and a time map exist; and a flag which indicates whether the stream is an ordinary broadcast stream or a server-type broadcast stream.

52.   A broadcast video/audio data recording method characterized in that input broadcast video/audio data is converted into a format that can be reproduced with a reproducing apparatus for reproducing the broadcast video/audio data, and then recorded in the converted format.

53.   A data recording medium recording data that is recorded by the broadcast video/audio data recording method according to Claim 47.

54.   A data recording apparatus for recording data by the broadcast video/audio data recording method according to Claim 47.

55.   A data reproducing apparatus for reproducing data by the broadcast video/audio data recording method according to Claim 47.